HEPATITIS C

WHAT THE TULSA FIRE DEPARTMENT SHOULD DO ABOUT IT.

Strategic Management of Change

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An applied research project submitted to the National Fire Academy as a part of the Executive Fire Officer Program.

September 1998

ABSTRACT

Members of the Tulsa Fire Department (TFD) were given an annual physical by the City of Tulsa Medical Director. The problem was that there was no screening of the blood samples taken during the exam for the Hepatitis C virus (HCV). The purpose of this research was to identify if there is a need, as a part of the annual physical, for the screening of the blood of members for HCV. The study used descriptive methodology as well as historical techniques. The research questions were:

1. What is known about HCV?
2. What individuals are at risk to become infected with HCV?
3. How many members of the Tulsa Fire Department have been diagnosed with HCV?
4. What is the current cost of the annual physical exams conducted by the City of Tulsa Medical Directors Office?
5. What would be the additional cost of the HCV screening per individual?
6. Is there and effective treatment for those infected and diagnosed with HCV?
7. Is there an effective and safe vaccine on the market for HCV?

The procedures involved obtaining literature on HCV from the National Fire Academy Learning Resource Center, local Tulsa City/County Libraries, internet access from the Centers for Disease Control in Atlanta, Georgia, and personal interviews with the City of Tulsa Medical Office Staff.

The results were relevant information about HCV was discovered and individuals that are at risk of becoming infected identified. It was discovered that in the last three years, three members of the TFD had been diagnosed with HCV. The cost for the HCV

screening would add an additional $66.25 per individual to the existing cost of the physical. There was treatment for individuals diagnosed with HCV but treatment was most successful when it was started early after infection. There was no recommended safe and effective vaccine found for the disease.

Two major recommendations were for the screening for HCV to be added to the annual physical exam so that those found to be infected may start the interferon treatment as soon as possible. The second was that continued study is conducted to find an effective and safe vaccine for the HCV as soon as one became available, and once available, an inoculation program for HCV would be fully implemented.

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INTRODUCTION

The members of the Tulsa Fire Department (TFD) have the option of taking an annual physical exam conducted by the City of Tulsa Medical Director or providing documentation of the results of a comparable exam from their own personal physician. This exam requirement is a part of the Collective Bargaining Agreement (CBA) between the City of Tulsa and The International Association of Firefighters (IAFF) Local 176. The problem was that there is no screening of the blood samples taken during the exam for the Hepatitis C virus (HCV). The purpose of this research is to identify if there is a need, as a part of the annual physical, for the screening of the blood of members for HCV. The study used descriptive methodology as well as historical techniques. The research questions were:

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BACKGROUND AND SIGNIFICANCE

Collective Bargaining Agreement

As a part of the CBA between the City of Tulsa and the IAFF Local 176, members of the TFD are required to receive an annual physical examination conducted by the City of Tulsa Medical Director. (See Appendix A, p 18) If a member so chooses, they may elect to have a comparable physical exam conducted by their personal physician but must provide the results to the City Medical Director. Although blood is draw and tests conducted on the blood, only routine tests are run on the samples. There is no required screening performed on the blood samples for HCV.

First Responder Agency

In 1994 the TFD became a basic life support first responder agency, training all personnel to the First Responder Certification level. This decision increased the number of medical calls significantly in the first six months and has continued to increase every year since. Currently, the emergency medical calls account for approximately 48% of all emergency calls for the TFD. The potential for exposure of TFD members to infectious disease has also dramatically increased since the inception of this program.

Infectious Disease Control Training

In 1994 the TFD began training all supervisors in the National Fire Academy (NFA) course, Infection Control for Emergency Response Personnel: Supervisors Role in which the principle of Body Substance Isolation (BSI) is emphasized. It also included training in the proper use of personal protective equipment, exposure protection, post-exposure protocols, modes of transmission for disease, and other related topics as prescribed by the Occupational Safety and Health Administration. This training was in

turn passed on to company personnel by their immediate supervisor. In subsequent years a refresher on infection control and BSI has been given to company personnel as a part of the continued training in pre-hospital emergency medical care. This program takes into account all laws, regulations, standards and guidelines governing employees that may be exposed to blood or other body fluids.

Infectious Disease Reporting and Management

The Safety and Health Branch of the TFD is responsible for filing of reports of all job related injuries and medical exposures, and the subsequent follow-up for all fire department personnel.

This applied research project is related to the Strategic Management of Change course, module two, in the fact that an analysis of the existing physical exam program was made to determine what deficiencies existed. The current program was then compared to the organizations mission statement and strategic goals for personnel to determine if it was consistent with those goals. (See Appendix B, p 20) Additionally, the method for change was assessed and the technical method selected as the proper approach to this problem.

LITERATURE REVIEW

According to Phyllis Stoffman, (1995), prior to 1988, HCV was known as non-A, non- B hepatitis. It was the third kind of viral hepatitis named and recognized and it is believed to be the most common type of viral hepatitis in the United States. She indicates that the Centers Disease Control (CDC) estimates that 150,000 Americans are infected each year. Approximately 8,000 to 10,000 Americans die each year from long-term liver

damage caused by Chronic Hepatitis C. HCV is spread mainly through blood to blood contact through transfusions, IV drug use, kidney dialysis, and needle sticks. Those at risk for infection are IV drug users, blood transfusion recipients, people with multiple sex partners, patients in hemodialysis centers, dentists, lab workers, and emergency room workers or others exposed to blood in their work. The HCV virus takes six weeks to six months to appear in the blood once a person has become infected. A person remains infectious as long as the virus remains in the blood. The chances of becoming a carrier of the HCV are at least 65%, where with Hepatitis B (HBV) it is only about five percent. Liver cancer is much more likely to develop from HCV than HBV, and once liver cancer is discovered, death usually follows in a few months. There are blood tests available to detect the HCV antibodies in the blood. Once anti-bodies are discovered then additional test are required to rule out hepatitis A (HAV) and HBV. Additionally, a liver function test is needed along with a liver biopsy taken to positively diagnose HCV.

The CDC ("Hepatitis C Fact Sheet," 1998) reports the incidence of total infections of HCV within the United States between 28,000 and 180,000 per year. Chronic infections result in approximately 85% of all infected persons and chronic lever disease develops in around 70% of those infected with HCV. The transmission of the disease is primarily bloodborne, but is also transmitted through sexual contact with an infected person or from mother to unborn child. Those groups at risk for being infected are consistent with Stoffman's list above but, additionally include health care workers, infants born to infected mothers, and recipient of clotting factors prior to 1987. The treatment for those diagnosed with HCV is interferon alpha injections of 3 million units,

three times a week for a period of 12 months. There is only about a 15% to 25% sustained response in these patients after the 12-month therapy.

In another Internet finding from the CDC ("Hepatitis C Prevention," 1992) HCV is described as a liver disease caused by the HCV, which is found in the blood of persons who have the disease. One group that is identified as being in a very high risk category for becoming infected are those who have a job that exposes them to human blood. In the United States, approximately 600 deaths each year are attributed to liver failure shortly after being infected with HCV. If an individual is infected with HCV the CDC recommends that they do not donate blood, plasma, body organs or tissue, or sperm. They further recommend not sharing razors, toothbrushes, or other items that could become contaminated with blood. The covering of open sores or breaks in the skin are also listed among the recommended methods for reducing the spread of the disease. Additionally, they recommend that an infected person follow "safer-sex" guidelines to reduce the chances of spreading HCV by sexual contact.

Douglas D. Schoon (1994) states that hepatitis B and C viruses accumulate in the blood and saliva of an infected person in far greater amounts than in persons infected with Human Immunodeficiency Virus (HIV), which is the virus that causes Acquired Immune Deficiency Syndrome (AIDS). Although there are effective and safe vaccinations available for HAV and HBV there is no vaccine for HCV at this time.

Katie Hooten (1997) describes HCV as the most dangerous form of hepatitis accounting for 8,000 to 10,000 deaths a year in the United States. She states that hepatitis and tuberculosis are growing threats and that health care workers are a high risk for both.

In an article on infectious disease, Katherine West (1992) defines exposure to bloodborne diseases as a contaminated needle stick, blood or body fluid contact with the mucous membrane surface of the eye, nose, or mouth, blood or body fluid contact with an open area of the skin, and cuts with sharp objects covered with blood or body fluids. Each of these is a risk to any worker that is involved in medical care that is rendered in an uncontrolled workplace.

According to the IAFF (1994), one out of every 15 fire fighters and emergency medical personnel is exposed to AIDS, HIV, HBV, tuberculosis, or other serious contagious diseases in the line of duty.

A reference manual for the CDC ("Videoconference," 1997) identifies the most efficient transmission of HCV is through percutaneous exposures such as transfused blood, drug-use, and needle sticks to health care workers. However, sexual and household exposures to infected individuals have also been associated with the transmission of HCV in the United States. In most instances evidence of chronic HCV infection will be discovered through screening test at the time of blood donation or routine physical examination. At this time, there is no vaccine to prevent HCV, and immunoglobulin is not effective for post- exposure prophylaxis. Several studies suggest that interferon treatment begun early in the course of HCV infection is associated with a higher rate of resolved infection.

The nurse in charge of the physical exams with the City of Tulsa Medical Directors Office, Frankie Parke, (personal communication, July 7, 1998) revealed that there have been three TFD members diagnosed with HCV in the past three years. However, there have been no known cases of HBV, HIV, AIDS or tuberculosis in the

same time period. All three members have subsequently been allowed to return to work when released by Dr. William Lewis, an infectious control doctor, with the Infection Disease Clinic in Tulsa. The current blood screening from blood samples drawn during the required physical exam measures blood cholesterol levels, blood sugar levels, HBV anti-bodies, and liver enzymes. The cost of the current physical, including a treadmill and EKG evaluation is $298.35 per individual. The cost of the HCV screening would add an additional cost of $66.25 per individual to the cost of the physical exam. This would raise the total cost per member examined to $364 .60.

L. Schneider and R. Geha (1994) reported that two intravenous immunoglobulin products, Gammagard {Registered} and Polygam {Registered} were removed from the market after the Food and Drug Administration was notified of 14 possible cases from three different countries of acute HCV among persons who had received these products.

PROCEDURES

Research Methodology

The desired outcome of the applied research project was to identify if there is a need, as a part of the annual physical, for the screening of the blood of members of the TFD for HCV. The study used descriptive methodology as well as historical techniques to arrive at the final product. In an effort to complete this task general information was studied to establish a definition for HCV and ascertain who is at risk in becoming infected with the disease. Additionally, the goal was to find if there are effective treatments for individuals infected, and if there is an effective and safe vaccine currently on the market for HCV. Historical data relating to known infections of HCV among TFD

members, current cost for the annual physical exam, and the cost for HCV screening were acquired through an interview with the nurse at the City of Tulsa Medical Directors Office who is in charge of the physical examinations.

Literature Review

The review of literature was performed a two different locations. The first was at the NFA Learning Resource Center in Emmitsburg, Maryland, and the second at local libraries of the Tulsa City/County Public Library System. The search was made under the titles of Infectious Diseases and Hepatitis and many articles, periodicals, and books were identified. The most current information however, was on the Internet. The CDC had several very timely postings on the Internet and it yielded a great deal of information that was in simple, understandable terms.

Personal Communications

An interview was conducted with Frankie Parke B.S.N., R.N. who is an Occupational Health Nurse with the City of Tulsa Medical Directors Office. Information was gained about the number of HCV infections to TFD members in the last three years, the cost of the associated screening for HCV and the cost of the current annual physical examinations.

Limitations and Assumptions

Information found on HCV was somewhat limited and vague at times. With the exception of the CDC most sources had only a small amount of information, sometimes only one paragraph, specifically about HCV. This could be due to the relative short time that HCV has been recognized and identified. The decision was made by this author to avoid technically laden information and this caused some of the sources to not be used

for purpose of this project. The information gained from the medical director's office was somewhat sensitive in nature and was limited strictly to numbers of infections and did not reveal the identities of the individuals for any further follow-up on current health status. Also, no information was acquired as to circumstances surrounding the individuals diagnosed as to whether their infection was from a known exposure or some other source.

Definition of Terms

Acquired Immune Deficiency Syndrome (AIDS) – the disease that results from the presence of the HIV virus, which attacks the immune system of carriers.

Antibody – A substance that kills or slows the growth of bacteria, used to combat bacterial infection.

Hepatitis – any infection or inflammation of the liver.

Human Immunodeficiency Virus (HIV) – the virus that causes AIDS

Immunoglobulin – Pooled human blood plasma that contains protective antibodies against a disease such as hepatitis.

RESULTS

What is known about HCV?

HCV is a viral hepatitis that is believed to be the most common type of hepatitis in the United States and is responsible for approximately 8,000 to 10,000 deaths per year. Estimates are from 28,000 to 180,000 new infections each year in the United States. In 1989, it became the third type of hepatitis named and recognized. Like all categories of hepatitis, HCV also effects the liver causing, in many cases, cirrhosis of the liver and

liver cancer. HCV is spread through blood to blood contact, sexual contact, or from mother to unborn child. The virus takes six weeks to six months to appear in the blood once a person has become infected. The risk of being infected by the virus is much greater than that of HBV or even AIDS. Once a person is infected, they are contagious as long as the virus remains in the blood.

What individuals are at risk to become infected with HCV?

Those at high risk for becoming infected with HCV are: IV drug users, infants born to infected mothers, kidney dialysis patients, blood transfusion recipients, people with multiple sex partners, patients in hemodialysis centers, dentist, lab workers, emergency room workers, and those exposed to blood and body fluids in their workplace. One source estimated that one in fifteen firefighters or emergency medical personnel are exposed to serious contagious disease in the line of duty.

How many members of the Tulsa Fire Department have been diagnosed with HCV?

In the last three years, three members of the Tulsa fire Department have been diagnosed with HCV. The three individuals are still currently employed, and working in the fire suppression division and responding to emergency medical calls as first responders.

What is the current cost of the annual physical exams conducted by the City of Tulsa Medical Directors Office?

The cost of the exam, including a treadmill and EKG evaluation, is $298.35 per member. If the City Medical Director gave every member in the department their physical, the total cost would be 690 x $298.35, for a maximum total cost to the city of

$205,861.50 per year. The actual cost is somewhat less in that some members choose to go to their personal physician for the examination.

What would be the additional cost of the HCV screening per individual?

The cost of the screening for HCV would be an additional cost of $66.25 per member. If the City Medical Director gave every member in the department their physical, including the HCV screening, the total cost would be 690 x $364.60, for a maximum total cost to the city of $251,574 per year. This would be an overall increase of $45,712.50 per year. Although this is not an insignificant amount, when it is compared to a total fire department budget of 53 million the total cost is only .4% of the total budget and the increase is only .09%.

Is there an effective treatment for those infected and diagnosed with HCV?

The treatment for those diagnosed with HCV is an interferon alpha injection of 3 million units, three times a week for a period of 12 months. There is only about a 15% to 25% sustained response in those patients after the 12-month therapy. Several studies suggest that the interferon treatment is most effective when started in the early stages of infection.

Is there an effective and safe vaccine on the market for HCV?

The Food and Drug Administration in 1994, because of reports of the products infecting recipients with HCV, removed two registered immunoglobulin products from distribution. Although there are effective and safe vaccinations available for HAV and HBV, there is no vaccine for HCV at this time.

Conclusion

HCV is a very dangerous infectious virus that causes serious liver disease and is responsible for numerous deaths in the United States each year. Healthcare workers, including firefighters and emergency medical personnel, are workers that face a high risk for being exposed to HCV. The number of reported infections of people in the United States is significant and the perils of the pre-hospital care workplace make the risk even more threatening to all healthcare workers.

Three Tulsa firefighters have been diagnosed within the last three years with HCV. In comparison there have been no known cases of HBV, HIV, AIDS or tuberculosis in TFD members for the same time period. Information was not obtained as to the nature of how these members were infected, but the fact that they have returned to work and are currently placing those who work with them at risk for exposure should be a concern.

The HCV virus can be tested for and it is imperative, for successful treatment, that the proper interferon injections start early after infection. There are no effective and safe vaccines available for HCV currently on the market.

DISCUSSION

The purpose of this research is to identify if there is a need, as a part of the annual physical, for the screening of the blood of members for HCV. The information obtained during this analysis and study indicate to this author that the screening is needed.

The statistics (Hooten, 1997; Stoffman, 1995; CDC Hepatitis C Fact Sheet, 1998; CDC Hepatitis C Prevention, 1992) that 8,000 to 10,000 Americans die every year from

HCV alone, supports the fact that this is a serious disease and one that should not be overlooked or taken lightly. Also, the numbers of reported incidence of infections in the United States ranged from 28,00 to 180,000 per year and is equally alarming. Additionally, (Schoon, 1994) there is a greater risk in becoming infected with HCV than HBV, HIV, or AIDS. These facts brought to light that members of the TFD are dealing with a very serious disease with a high potential for exposure.

The fact that the personal interview with Frankie Parke, of the medical director's office, revealed the three infected members of the TFD also could not be considered insignificant. The members are currently working in the suppression division responding to medical emergencies and living at the fire station with other members of the department.

The literature (CDC Hepatitis Fact Sheet, 1998; CDC Hepatitis C Prevention, 1992; Hooten, 1997; West, 1992) identifies numerous individuals or groups that are at high risk for exposure to HCV. All list healthcare workers or those exposed to blood and body fluids as a part of the high-risk list. Additionally, the IAFF the reports the one in fifteen firefighters or emergency medical personnel are exposed to serious diseases in line of duty. TFD members likewise are at risk of being exposed.

The importance of early detection and early treatment are supported in the reference manual ("Videoconference," 1997) and brings to light the importance of a screening program for HCV being implemented for the members of the TFD. Two sources (Scneider, Geha, 1994; Schoon, 1994) pointed out that there is not an effective and safe vaccine on the market for HCV. Although most members have taken the HBV vaccine one for HCV is not at this time available. Because of the reported success of the

HBV inoculation program, one should be sought after for HCV and a program implemented as soon a vaccine is available that is determined effective and safe.

RECOMMENDATIONS

The recommendations are for the screening for HCV to be added to the annual physical exam so that those found to be infected may start the interferon treatment as soon as possible. Secondly, additional information on HCV should be added to current infectious disease control curriculum so that TFD members will be better informed about exposure risks, treatment procedures, and HCV disease prevention. Additionally, further study should be conducted on the current infected TFD members as to their risk to those they work and live with. Finally, continued study should be conducted to find an effective and safe vaccine for the HCV as soon as one becomes available, and once available, an inoculation program for HCV should be fully implemented.

REFERENCE LIST

Center for Disease Control. (1998, June 23). Hepatitis C fact sheet. Hepatitis Home Page. [On line]. Available: www.cdc.gov.

Center for Disease Control. (1997, November 22). Reference manual. Videoconference on Hepatitis C. [On line]. Available: www.cdc.gov.

Center for Disease Control. (1992, April 1). Hepatitis C prevention. Hepatitis Home Page. [On line]. Available: www.cdc.gov

Hooten, Katie. (1997). Workplace perils. Occupational Health and Safety, 66, 50-53.

International Association of Firefighters. (1994). IAFF wins fight to notify firefighter exposed to infectious diseases. International Firefighter, 77, 1

Schneider, L., Geha, R. (1994, July 22). Outbreak of HCV associated with IGIV administration. Epidemiological notes and reports outbreak of hepatitis C associated with intravenous immunoglobulin administration. [On line] Center for Disease Control. Available: cwus@cdc.gov.

Schoon, Douglas D. (1994). HIV/AIDS and hepatitis, everything you need to know to protect yourself and others. New York: Milady Publishing Company.

Stoffman, Phyllis. (1995). The family guide to preventing and treating 100 infectious illnesses. New York: John Wiley and Sons Inc.

West, Katherine. (1992). Assessing the risks. Emergency, 24, 30-33.

APPENDIX A

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Article 29
of the Collective Bargaining Agreement Between The City of Tulsa and Local 176 of the International Association of Firefighters

Article 29 – Physical Examinations

Section 29.1 Employer shall provide an annual evaluation for all Employees covered by this agreement for blood pressure, weight and pulmonary and audio-metric testing. Employer shall provide a complete physical examination, the frequency of which shall be determined by the Safety and Health Committee.

The examination shall include but not be limited to:

A. A complete history.

B. Check of height, weight, and vital signs.

C. Examine head, eyes, ears, nose, and throat including vision test and ophthalmoscopic examination.

D. Examine heart and lungs including a chest x-ray and EKG.

E. Examine abdomen.

F. Digital examination of rectum.

G. Examine the genitals' extremities.

H. Do a urinalysis and a battery of blood chemistries.

Section 29.2 It is not the intent of this Agreement to substitute the examination provided above for an individual's personal program with his physician. If an individual elects to continue his personal program, he shall provide a letter from his physician to the City Physician stating that he ahs undergone a comparable physical and the results thereof (e.g., in good health, etc.).

Section 29.3 If treatment of conditions found to exist through the examination is of such a nature, in the opinion of the City Physician, as to not require referral to and extensive follow-up by a private physician, the City Physician may prescribe medicine and treatment for said condition. n

APPENDIX B

It is OUR MISSION to protect community life, health, property and the environment by delivering quality life and fire safety service

To accomplish our mission, it is essential that we recognize the following service strategies

- ✧ Aggressively deliver life and fire safety education to the community
- ✧ Aggressively work to prevent hazardous conditions
- ✧ Respond promptly to rescues, fires, medical emergencies and natural disasters
- ✧ Ensure actions are safe, professional, and in harmony with the needs of the environment and the demands of the community.
- ✧ Actively coordinate our service with other agencies in the region
- ✧ Actively seek to provide other community services within the scope of our mission

Furthermore, to help our organization accomplish its mission, we realize that:

- ✧ Each individual is valuable to the department
- ✧ Each individual must be treated ethically and provided training, proper equipment, support, safety, and opportunity.
- ✧ Each individual is accountable to others in the organization, the department, and the public

The <u>real work</u> we must do is: